INDIANA DEPARTMENT OF TRANSPORTATION
OFFICE OF MATERIALS MANAGEMENT

PORTLAND CEMENT CONCRETE PLANT INSPECTION
ITM No. 405-08P

1.0 SCOPE.

1.1 This procedure covers the field inspection of PCC plants. The inspection will identify the materials used in concrete production and the procedure for the storage and sampling of aggregates, cement, pozzolans, and admixtures. The inspection also covers scale and meter verification.

1.2 The values stated in either acceptable English or SI metric units are to be regarded separately as standard, as appropriate for a specification with which this ITM is used. Within the text, SI metric units are shown in parenthesis. The values stated in each system may not be exact equivalents; therefore, each system shall be used independently of the other, without combining values in any way.

1.3 This ITM may involve hazardous materials, operations, and equipment and may not address all of the safety problems associated with the use of the test method. The user of the ITM is responsible for establishing appropriate safety and health practices and determining the applicability of regulatory limitations prior to use.

2.0 TERMINOLOGY.

Definitions for terms and abbreviations shall be in accordance with the Department's Standard Specifications, Section 101.

3.0 SIGNIFICANCE AND USE.

This ITM is used to ensure that PCC plants are capable of producing concrete in accordance with applicable Department Standard Specifications.

4.0 APPARATUS.

4.1 Certified weights (masses)

4.2 Tanks and scales

5.0 PROCEDURE.

5.1 The PCC supplier shall request a Department inspection of the PCC plant.

5.2 The inspection date and time shall be mutually agreed upon.

5.3 The PCC supplier shall ensure that the required apparatus are on site.

5.4 The PCC plant will be inspected in accordance with the following procedures and the results recorded on the form in Appendix A.

5.4.1 Record the plant identification data

5.4.2 Inspect the aggregate storage

5.4.3 Inspect the aggregate conveying system

5.4.4 Inspect the storage and conveying system

5.4.5 Review the admixture control systems

5.4.6 Check all gates to confirm non-leakage by charging material into each bin and then into the weigh hopper

5.4.7 Locate the cementitious weigh hopper

5.4.8 Locate the aggregate weight hopper

5.4.9 Locate the cementitious sampling ports

5.4.10 Review the batching method

5.4.11 Examine the discharge boot

5.4.12 Determine if the scales zero prior to charging

5.4.13 Determine if a moisture probe is present

5.4.14 Determine where the admixtures are introduced

5.4.15 Determine the type of scales

5.4.16 Determine the method of addition and source of water

5.4.17 Verify that the supplier has checked the blades for wear

5.4.18 Locate the automatic timing device

5.4.19 Locate the automatic discharge locking device

5.4.20 Review the cold weather concreting procedure, if applicable

5.4.21 Have the supplier certify the admixture metering and proportioning systems

5.5 The aggregate, cementitious, and water scales will be checked in accordance with 508.02(b) and recorded on the form in Appendix A.

5.5.1 Record the scale identification data

5.5.2 Ensure that all weigh hoppers are clean and empty prior to calibration

5.5.3 Apply the necessary calibration equipment such as chains or platforms

5.5.4 Tare the scales

5.5.5 Load the first increment of weight (mass)

5.5.6 Compare to the known weight (mass) for variance

5.5.7 Repeat 5.5.5 and 5.5.6 in a cumulative manner throughout the working capacity of the scales, plus 10 percent. Calibration will include a minimum of four points.

5.6 The meters will be checked in accordance with 508.02(b) and recorded on the form in Appendix A.

5.6.1 Record the meter identification data

5.6.2 Instruct the plant operator to pump the first increment of volume into a tared container

5.6.3 Calculate the weight (mass) of the volume in the tared container

5.6.4 Measure the weight (mass) of the volume in the tared container

5.6.5 Compare the measured weight (mass) to the calculated weight (mass) for variance

5.6.6 Repeat 5.6.2 through and 5.6.5 in a cumulative manner throughout the working range of the meter, plus 10 percent

5.6.7 The calibration will include a minimum of three consecutive passing test results.

6.0 CRITICAL ELEMENTS.

6.1 The PCC plant will not be approved if the following critical elements of the plant operations are not met.

6.2 Cementitious.

6.2.1 There is a system to prevent contamination within the silos or bins.

6.2.2 The conveying system prevents contamination.

6.3 Weigh Hopper.

6.3.1 The coarse and fine aggregate gates are tight and not leaking.

6.3.2 The cementitious gates are tight and not leaking.

6.3.3 There are cementitious sampling ports.

6.4 Batching.

6.4.1 The scales are zero prior to charging.

6.4.2 The water is potable or documentation is supplied indicating the water is potable in accordance with 913.01.

6.5 Mixing.

6.5.1 The blades are in accordance with the manufacturer's recommendations.

6.5.2 The mixer is equipped with a timing device.

6.5.3 The mixer is equipped with an automatic locking device.

6.6 Certification.

6.6.1 The supplier can certify the admixture metering system.

6.6.2 The supplier can certify the accuracy of the proportioning system.

6.7 Scales and Meters.

6.7.1 The difference between the scale reading and the actual weight (mass) applied is less than or equal to one half percent.

6.7.2 The difference between the meter reading and the actual volume is less than or equal to one percent.

7.0 REPORT.

7.1 Report Appendix A

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PORTLAND CEMENT CONCRETE PLANT INSPECTION

PLANT OWNERS NAME	PLANT CAPACITY	PLANT NUMBER
OWNER'S HOME OFFICE ADDRESS	PLANT MANUFACTURER	MANUFACTURED DATE
PLANT LOCATION AND ADDRESS	TYPE OF PLANT □ CENTRAL □ SHRINK □ TRANSIT	MODEL NUMBER
PLANT AREA CODE AND PHONE NUMBER		INSPECTION DATE

AGGREGATES
CHECK SOURCES OF ALL AGGREGATES USED AT PLANT. REVIEW COPIES OF MOST RECENT WEIGH TICKETS FOR ALL AGGREGATES INTENDED FOR INDOT USE. (IDENTIFY NON-INDOT AGGREGATES AS "COMMERCIAL ONLY").

SIZE/TYPE	*SOURCE NAME AND NUMBER*	*APPROVAL (Q#)*	***CLASS/ LEDGE***	INDOT APPROVED

COMMENTS:

CEMENTITIOUS MATERIALS
CHECK SOURCES OF ALL CEMENTITIOUS MATERIALS POTENTIALLY UTILIZED AT THE PLANT. THIS WILL INCLUDE CEMENT, GGBFS, FLY ASH, AND SILICA FUME. REVIEW COPIES OF MOST RECENT BILLS OF LADING. (IDENTIFY NON-INDOT MATERIALS AS "COMMERCIAL ONLY").

MATERIAL	*TYPE/CLASS*	*SOURCE **NAME AND NUMBER***	*APPROVAL #*

COMMENTS:

CHEMICAL ADMIXTURES
CHECK SOURCES OF ALL ADMIXTURES POTENTIALLY UTILIZED AT THE PLANT. REVIEW COPIES OF MOST RECENT DELIVERY TICKETS. (IDENTIFY NON-INDOT MATERIALS AS "COMMERCIAL ONLY").

NAME	*TYPE*	*SOURCE NAME AND NUMBER*	*APPROVAL #*

COMMENTS:

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AGGREGATE STORAGE
YES NO
☐ ☐ BY STOCKPILING
☐ ☐ IN BINS
☐ ☐ ARE AGGREGATES KEPT FROM INTERMIXING

CORRECTIVE ACTIONS: _____

_____

_____

AGGREGATE CONVEYING SYSTEM
☐ BELT ☐ BUCKET ELEVATOR ☐ OTHER
IF OTHER, EXPLAIN:

_____

_____

_____

CEMENTITIOUS
YES NO
☐ ☐ IS THERE A SYSTEM TO PREVENT CONTAMINATION WITHIN SILOS OR BINS
☐ ☐ DOES THE CONVEYING SYSTEM PREVENT CONTAMINATION
CORRECTIVE ACTIONS: _____

_____

_____

ADMIXTURES
YES NO
☐ ☐ CONTROLLED BY VOLUME
☐ ☐ CONTROLLED BY WEIGHT (MASS)
☐ ☐ ADDED MANUALLY
☐ ☐ ADDED AUTOMATICALLY

BINS/HOPPER
YES NO
☐ ☐ ARE COARSE AND FINE AGGREGATE GATES TIGHT AND NON-LEAKING
☐ ☐ ARE CEMENTITIOUS GATES TIGHT AND NON-LEAKING
☐ ☐ ARE WEIGH HOPPER GATES TIGHT AND NON-LEAKING
☐ ☐ IS THE CEMENTITIOUS WEIGHT HOPPER SEPARATE FROM THE AGGREGATE WEIGH HOPPER
☐ ☐ IS THERE A CEMENT SAMPLING PORT IN THE SILO
☐ ☐ IS THERE A CEMENT SAMPLING PORT IN THE WEIGH HOPPER
☐ ☐ IS THERE A SYSTEM TO PREVENT OVERLOADS

CORRECTIVE ACTIONS: _____

_____

_____

BATCHING
YES NO
☐ ☐ IS BATCHING CONDUCTED MANUALLY
☐ ☐ IS BATCHING CONDUCTED AUTOMATICALLY
☐ ☐ IS DISCHARGE BOOT CLEAN AND FUNCTIONING PROPERLY
☐ ☐ DO SCALES ZERO PRIOR TO CHARGING
☐ ☐ IS THERE A MOISTURE PROBE IN THE COARSE AGGREGATE
☐ ☐ IS THERE A MOISTURE PROBE IN THE FINE AGGREGATE

ARE BATCH TICKETS PRINTED
☐ AUTOMATICALLY ☐ MANUALLY

WHERE AND WHEN IS ADMIXTURE INTRODUCED
_____

_____

_____

SCALES
☐ DIAL ☐ LOAD CELL ☐ OTHER

IF OTHER, EXPLAIN: _____

_____

_____

_____

_____

_____

_____

IS WATER ADDED BY
☐ VOLUME/METERED ☐ WEIGHT (MASS)

IS SOURCE OF WATER
☐ COMMERCIAL ☐ OTHER

IF OTHER, EXPLAIN: _____

_____

_____

CORRECTIVE ACTIONS: _____

_____

_____

_____

_____

_____

_____

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MIXING
YES NO
☐ ☐ HAS THE SUPPLIER CHECKED THE BLADES FOR WEAR IN ACCORDANCE WITH THE MANUFACTURERS RECOMMENDATIONS

DATE CHECKED _____
☐ ☐ IS THE MIXER EQUIPPED WITH A TIMING DEVICE
☐ ☐ IS THE MIXER EQUIPPED WITH AN AUTOMATIC DISCHARGE LOCKING DEVICE

CORRECTIVE ACTIONS: _____
_____
_____
_____

COLD WEATHER PRODUCTION
YES NO
☐ ☐ IS THE PLANT CAPABLE OF PRODUCING COLD WEATHER CONCRETE
☐ ☐ IS THERE A SYSTEM FOR MONITORING TEMPERATURE
☐ ☐ CAN THE WATER BE HEATED
☐ ☐ CAN THE AGGREGATES BE HEATED
☐ STEAM ☐ DRY ☐ OTHER

CERTIFICATION

I CERTIFY THAT THE ADMIXTURE METERING SYSTEM IS ACCURATE AND MAINTAINED TO ONE PERCENT, IF BY VOLUME AND ONE HALF PERCENT, IF BY WEIGHT.

I ALSO CERTIFY THAT THE ACCURACY OF THE PROPORTIONING SYSTEM IS MAINTAINED IN ACCORDANCE WITH THE FOLLOWING:

ADMIXTURE……...±3 %
AGGREGATES……± 2 %
CEMENTITIOUS MATERIALS…….± 1 %
WATER…….....± 1 %

_____ _____ _____
SUPPLIER'S SIGNATURE TITLE DATE

REMARKS
_____
_____
_____

DEPARTMENT SIGNATURE	CLASSIFICATION	DATE SIGNED

DISTRICT TESTING OFFICE TELEPHONE NUMBER

THIS IS TO CERTIFY THAT I HAVE ACCOMPANIED THE DEPARTMENT ON THIS INSPECTION FOR THE ABOVE NAMED CONCRETE PLANT AND HAVE GIVEN ALL INFORMATION, TRUE AND COMPLETE, TO THE BEST OF MY KNOWLEDGE. I UNDERSTAND THAT ONLY INDOT APPROVED MATERIALS MAY BE INCORPATED INTO CONCRETE FOR INDOT CONTRACTS AND PURCHASE ORDERS. I WILL CONTACT THE INDOT TESTING OFFICE TO UPDATE THIS MATERIAL APPROVAL LIST IF WE CHANGE ANY SOURCE, SUPPLIER, OR MATERIAL.

SUPPLIER'S SIGNATURE	DATE SIGNED

DISTRIBUTION:
MATERIALS MANAGEMENT DIVISION
DISTRICT TESTING ENGINEER
SUPPLIER

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INSPECTION OF SCALES AND METERS FOR CONCRETE PLANT

PRODUCER _____ PLANT LOCATION _____
PLANT NO._____

Scales and meters will be checked to the maximum capacity for which they will be used. The allowable difference between the scale reading and the actual weight applied shall be one half percent or less. Meter variation shall also be one percent or less. Scales will be checked cumulatively throughout the working capacity plus approximately ten percent. At least three points within the working range for meters will be checked.

AGGREGATE SCALE CHECK
MAKE_____ SERIAL NO._____ CAPACITY_____

LOAD APPLIED							
SCALE READING							
ERROR, LBS (KG)							
PERCENT ERROR							

CEMENT SCALE CHECK

MAKE _____ SERIAL NO._____ CAPACITY _____

LOAD APPLIED							
SCALE READING							
ERROR, LBS (KG)							
PERCENT ERROR							

WATER SCALE CHECK

MAKE_____ SERIAL NO._____ CAPACITY_____

GALLON (LITER)							
WEIGHT (MASS) APPLIED							
SCALE READING							
ERROR, LBS (KG)							
PERCENT ERROR							

REMARKS
_____
_____
_____
_____

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PLANT NO__________________

WATER SCALE CHECK (CON'T)

______________________________SCALE

GALLON (LITER)							
WEIGHT (MASS) APPLIED							
SCALE READING							
ERROR, LBS (KG)							
PERCENT ERROR							

______________________________SCALE

GALLON (LITER)							
WEIGHT (MASS) APPLIED							
SCALE READING							
ERROR, LBS (KG)							
PERCENT ERROR							

______________________________SCALE

GALLON (LITER)							
WEIGHT (MASS) APPLIED							
SCALE READING							
ERROR, LBS (KG)							
PERCENT ERROR							

______________________________SCALE

GALLON (LITER)							
WEIGHT (MASS) APPLIED							
SCALE READING							
ERROR, LBS (KG)							
PERCENT ERROR							